

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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### THE INTRODUCTION OF THE RAILWAY SYSTEM. ITS EARLY HISTORY IN THE SOUTHERN COUNTIES.

The proposition to open a public subscription for the benefit of Mr. Wm. Henry James, C.E., in consideration of his labours in connection with the earliest efforts to secure to the world the enormous advantages of railway intercommunication, is one which will doubtless be well received by all classes of the community, and more particularly so by those who can trace their fortunes to the increased facilities which railway transit has afforded to the development of commercial and industrial enterprise. It is scarcely necessary to remind the readers of the *Mining Journal* that the claim of Mr. William Henry James is chiefly founded upon the services rendered by his late father, Mr. William James, of Warwick, such services having been largely participated in by Mr. Wm. Henry James himself. But this is not the only claim which he has upon the consideration of the country, for it is beyond question that one of the most important appliances—tubes in the boilers—amongst the many necessary to secure a perfect locomotive was proposed by Mr. William Henry James, as is proved by an agreement made so early as 1821, by which the late George Stephenson and his partner were granted permission to use them in such locomotives as they might manufacture. The greater claim, however, being that connected with the introduction of the railway system itself, we will for the present content ourselves with referring to the early labours of Mr. William James, the father, in connection with a single group of railways, which does much to prove that he had an accurate knowledge of the requirements of the district which he proposed to accommodate, and a keen perception of the means of securing the largest possible commercial advantage.

We have before us a copy of a pamphlet now very scarce, issued by Mr. Wm. James in 1823, and entitled a "Report or Essay to Illustrate the Advantages of Direct Inland Communication through Kent, Surrey, Sussex, and Hants; to connect the Metropolis with the ports of Shoreham, Rochester, and Portsmouth, by a line of Engine Railroad, and to render the Grand Surrey Canal, Wandsworth and Merstham Railroad, Shoreham Harbour, and Waterloo-bridge shares productive property: with Suggestions for Diminishing Poor-rates and Relieving Agriculture." He tells us in his preface that "great caution has been used in determining the best gradient lines," and that he "has great confidence that when the surveys, sections, and estimates are completed they will verify and substantiate his views." He alludes to the then existing project for connecting London, Portsmouth, Shoreham, and Rochester by canal, but regards the capital required as an insuperable obstacle. As a substitute for the canal he proposes a railroad, remarking that "by recent improvements the engine railroad system is now applicable to most situations, whilst the facility and economy of its construction and repair, and the speed and regularity of its trade, must influence its extended adoption; in short, generally speaking the engine railroad may be formed at one-fifth the capital necessary for canals, whilst goods can pass thereon with three times the speed, and at one-third the expense, at all hours and in all seasons, with the greatest security."

The line which Mr. James proposed was "to commence at the south end of Waterloo-bridge, passing along the most vacant ground by Kennington, to fall into the present line of the Surrey railroad, near Tooting, which, being improved and altered to an engine railroad, will be continued by Croydon to Merstham (Merstham), where the new line will again commence, and pass near Bletchingly, eastward of Burstow Park, to near New-chapel (where it unites with the Portsmouth and Chatham line), and thence inclining to the south-west, will go near Imberhome, by Crawley Down, and near Rowfant to Tilgate and Saint Leonards Forests, and by Holmbush to Monk's Gate Common, Nuthurst, West Grinstead, near Steyning and Bramber to Shoreham and Brighthelmston (Brighton)." The line from Portsmouth was "to commence near the dockyards at Portsea and pass by the water-works engine at Farlington, to the west of Havant, near Stanstead, Funtington, through Kingley bottom, near Chilgrove, Old Read's Wood, near Cocking, Heyshot, Hayle, over the River Rother, by Petworth, Kidford, near Slinfold, Warnham, near Horsham, Roughy-street, Holmbush, and along part of the other line to Newchapel, whence it passes through Lingfield, Edenbridge, north of Chiddingstone, and crossing the turnpike road about midway between Seven Oaks and Tunbridge to Under River, near Ivy Hatch and Ingham; it then passes between Wrotham and Malling, along the plane of the open calcareous country by Spelding, Haling, Cuckstone, over the Salt Marsh at Strood, and ends at the port of Rochester." Branch lines were proposed to Havant, Midhurst, Horsham, East Grinstead, Malling, and other towns. Most of these branches would have been from a mile to two miles in length; the longest, that to East Grinstead, being about three miles. As a sufficient reason for adopting the engine railroad in preference to other means of conveyance, Mr. James tells us that "the carriage by sea is exposed to capture and tempest; by canal to frauds and robberies, as also to injurious delays from frosts in winter and want of water in summer; and consequently these communications must be very expensive and uncertain, whilst by railroad the conveyance may be equally regular and secure as by a mail coach, and more speedy if required."

It cannot, of course, be supposed that a railway, which was to be constructed for less than 250,000*l.*, would afford the same amount of accommodation now possessed in the counties through which Mr. James's line was to pass; but it cannot, we think, be questioned that had his proposition been carried, capitalists would have profited much more from their connection with railway enterprise than they have under the present system. The line to Brighton would have been 62 miles long instead of 50*l.* miles as at present; but we must remember that at the time this line was projected, it was proposed to make Shoreham a great harbour, that Mr. James sought only to afford accommodation to towns in proportion to their population, and that he sought not to disturb existing interests; whilst the railway system as actually carried out, has created towns where formerly none existed, and converted many formerly prosperous places into almost "deserted villages." With less than 150 miles of railroad, he would have placed a larger number of important towns within easy reach of the metropolis, than has been done by any line of similar length which has since been constructed or projected; for Portsmouth, Havant, Chichester, Midhurst, Worthing, Petworth, Horsham, Shoreham, Brighton, Crawley, Reigate, Croydon, East Grinstead, West Grinstead, Tunbridge, Seven Oaks, Rochester, Strood, Chatham, and Maidstone, would all have been either on his line, or within a very few miles (six at most in the case of Maidstone, Worthing, and Chichester) of it; whilst by taking the valley of the Adur to reach Brighton, instead of nearly the line of the old coach road by Clayton and Patcham, and by avoiding Reigate and Redhill

in the more northern portion of the line, nearly the whole of the heavy work now observable on the Brighton line would have been avoided. Assuming Mr. James's line to have been constructed, an additional line (not longer than that of the present South-Eastern Company from Reigate to Dover) could have been made, which would have given very good accommodation to Hailsham, Battle, Hastings, Rye, and the other towns along the southern coast of Sussex and Kent, so that with some 500,000*l.* little would have been left to be desired in the way of cheap transit between the metropolis and the principal places in the counties of Kent, Sussex, Surrey, and Hampshire.

We do not infer that the same amount of convenience would have been secured that we have at present, but the accommodation would have been ample for all ordinary purposes, and the capitalists providing it would probably have received 20 per cent. per annum instead of less than 5 per cent. upon their outlay. The views of Mr. James might not in all cases bear the criticism of those who are only inclined to compare his projects with existing circumstances; but we certainly think that those who pass judgment upon the subject, considering the state of affairs when the propositions were made, will admit that very considerable credit is due to Mr. William James, and that, only assuming his efforts to have been as valuable elsewhere as they were in the southern counties, his son is justly entitled to compensation for any loss he may have sustained through his father's losses in connection with the introduction of the railway system.

### MONEY MAKING—No. V.

To the Marking-room the accepted planchets of gold are now transferred. The name of this apartment conveys to the uninitiated no idea whatever of the operations performed within it. These are, nevertheless, of considerable importance, both as regards the artistic finish of coins, and their subsequent resistance to the wear and tear of circulation. It will be in the knowledge of all, that every properly manufactured, and unworn coin has raised edges on its outer circumference. Those edges are, of course, intended to preserve the engraved surfaces from abrasion or defacement, and the bolder and broader they are, the more likely are they to effect that desirable object. In the marking-room of the Mint all planchets of metal designed for conversion into coin—from the sixpence upwards—have their edges raised as a preliminary to the stamping process, and this is technically, but not very wisely, called "marking" them. How impressions are given to the blank discs will, of course, be hereafter explained, but it may be well, for the sake of elucidating the marking operation, to state here that they receive a very forcible blow between two steel dies. If it were necessary to strike each planchet with sufficient force to "get up" the edges as well as the impressions at a single blow, the probability is that the dies would break, however excellent the quality of the steel of which they were made, and however carefully they were tempered.

The marking, or edge raising transaction, obviates this danger. By submitting the planchets to the action of a skilfully contrived machine they are lessened slightly in diameter, and made thicker on their extreme circumferences. The extent to which this is done is governed by the boldness which the protecting rims of the coins are destined finally to present. Recently a new contrivance has been invented by one of the clever artisans of the Mint for marking planchets with extraordinary rapidity and precision. It has superseded a number of antiquated and very complicated machines, which for many years were in use, and is admired as much for its simplicity of construction as for its efficiency. A diagram would be requisite for the exact explanation of the characteristics of Jones's Patent Marking Machine. It consists, however, mainly of a strong steel disc, about 16 in. diameter, hung on the end of a spindle, which runs horizontally and freely in serrated bearings, so contrived as to prevent yielding from pressure. On the outer face of the steel disc a groove is turned to the depth of an eighth of an inch, and wide enough to receive the thickest planchet of metal in the series of British coins. A drum on the opposite end of the spindle, and over which a strap passes, receives motion from a subterranean shaft, and imparts it to the disc, which is thus made to revolve at a rapid rate. A steel cheek, having a groove of corresponding depth and width to that in the face of the disc, but forming only a small segment of a circle, is fixed directly opposite to the revolving disc. The distance at which the "cheek" stands from the latter is regulated by adjusting screws to the precise point required for the particular planchets to be operated upon.

It will now be understood, probably, that if the disc be fed with planchets of metal it will in the course of its revolutions carry them between itself and the cheek by mere force of friction, and administer to them in their passage a considerable amount of pressure. This is, in fact, the case, and at the rate of about 600 per minute golden planchets are thus passed through the marking-machine. They are placed in an inclined hopper or tray, fixed above the machine. A workman regulates by means of a little careful manipulation their orderly descent into a tube at the lower side of the hopper. A wheel of wrought-iron, 1 ft. in diameter, and with serrations, or coarsely pitched teeth, revolves vertically below the tube, and each tooth carries a planchet forward to an inclined spout, or regia-duct—as it may be termed,—down which it slides direct to the groove in the face of the disc. The speed at which the operation of marking is performed is governed, therefore, simply by the rate at which the disc revolves, and the regularity with which it is fed. In ordinary practice the planchets are delivered into a receptacle placed to catch them in a perfect and continuous stream.

With little trouble the patent marking-machine may be altered to suit any sized coin, from the florin to the sixpence, or from the bronze penny to the farthing. It is universal almost in its action, and it has the further advantage over all other contrivances which the writer has seen in foreign Mints for a similar purpose, that it is uniform in its results.

There is no reason why machines of this kind should not be employed for "marking" the edges of dollars, or crown pieces. They would simply require to be made stronger in their mechanical details than those for smaller coins, and it cannot be out of place to suggest the fact to the proprietors of Mexican and other Mints.

Presuming, then, that the whole batch of weighed, assayed, and accepted gold planchets have passed through the ordeal in question, and thus been advanced another stage towards their regal destiny, they are next sent to the Annealing-room. The rolling and adjusting operations have hardened the metal to such an extent that it would be difficult, if not impossible, to imprint upon it the image and superscription of Her Majesty; it must be,

therefore, annealed. The annealing-room of the Mint is by no means a handsome apartment. It has a cumbrous wooden roof, and a stone floor, and its six annealing ovens give it the appearance of a monster bake-house. In describing the annealing episode in the history of sovereigns it will be well, perhaps, to confine our attention *pro tem.* to one particular quantum of gold pieces; because by making our readers comprehend the mode of treatment pursued in the one case it will be understood in reference to all the gold which passes through the annealing-furnaces at the Royal Mint.

We will follow, then, one bag of "marked" work, consisting of 720 ozs., and numbering 2804 planchets, to the baking, pickling, and drying-rooms, for such they may be not inappositely named. A workman in the first instance discharges a portion of the contents of the bag into a mahogany ranging tray. This is an open and shallow box, 2 ft. 6 in. in length, and 9 in. broad, and with a series of longitudinal flutings in it. By shaking this box dexterously the workman causes the sovereign blanks to range themselves on edge, and in rouleaux along the flutings, which are of the proper diameter to accommodate them. The annealing-box, or pan, is next called into requisition, and this is of cast-iron. It is of just sufficient capacity to receive on edge and in rouleaux the 2804 pieces, and to allow room for their expansion by the heat to which they will presently be submitted. The transference of the planchets from the ranging tray to the annealing-pan is an easy matter, and it is quickly accomplished. The next movement is to enclose them in their purgatorial cell, and to prevent the admission to it of air during its stay in the oven. A wrought-iron cover, fitting easily into the annealing-box, and prevented from coming into contact with its rich contents by means of a rebated projection, is now laid over the rouleaux.

The outer edges of this cover are luted round with pot-clay or loam, prepared for the purpose, and which, like our brave soldiers, will "stand fire." To make assurance of the non-admission of air doubly sure, however, a second cover, with another luting of loam, is placed in the box.

The reasons for these precautions will be obvious to many, but it may be well to state, for the information of those who are less well-informed, that volatilisation and oxidation would otherwise take place, to a serious extent, and thus produce loss and inconvenience.

All being secure, and the oven, by means of a Jeukens's self-acting endless-chain furnace, brought to the proper heat, the oven-door is opened, and a small iron carriage on miniature wheels for a moment stops the way. Upon this carriage two such boxes as that we have described are placed, and then the whole is backed into the oven, and the door closed upon the precious load. The annealer keeps constant watch through an eye-hole in the oven-door upon the progress of the baking, and judges when it is time to draw the batch.

Whilst this operation is going on, it may be told by way of gossip that some thirty odd years ago a workman instead of putting 2804 sovereigns planchets into the oven, as he ought to have done, put them into his pockets, and under pretence of going out for refreshments disappeared with the gold for ever! It has been said that out-door confederates received the spoil, and then despatched the thief, but this is uncertain. Neither money nor thief came back to the Mint at all events. It is a mystery of the Mint, which probably will never be unveiled, and we shall certainly not now attempt to clear it up.

About forty minutes or less suffice to bring the annealing-box and its contents to a cherry-red heat, and then they are withdrawn.

Another twenty minutes suffices for the partial cooling of the annealing-box and its contents, and then the lids are removed. A flat copper tray with handles receives the planchets, which are at once transferred to the blanching or pickling-room, and immersed in a cold-water bath. This completes the annealing process, and now comes that of pickling. A cast-iron copper,—if the term be admissible—a cast-iron copper lined with lead, and partially filled by a weak, but boiling-hot solution of sulphuric acid and water, is at hand to receive the golden deposits, a cullender sustaining them during their immersion in pickle. By vigorously stirring them with an ashen stick, the workman is enabled to bring the faces of the planchets into direct contact with the acid, and thus to ensure the action of the latter upon each piece of gold. A very few minutes of submission to this treatment produces a wondrous effect upon the patients, which are next submitted to a *douche* bath of cold water, for the removal of any films of acid and particles of fire-clay which may adhere to them. The water disappears speedily through the perforations of the cullender, and then the planchets appear in their true colour—a bright and glistening yellow. In fact, every portion of oxide of copper which the fire has brought to their surfaces is now removed.

Of course, a slight diminution of the weight of the pieces results from the pickling or refining operation, but this has been allowed for previously, and the sediment remaining in the copper is carefully preserved, with the view to the extraction from it of any minute particles of gold which the stirring may have abraded and left in deposit. The next movement in the order of preparation for stamping is the drying of the blanks, and this is effected in an adjoining apartment, and by means of a drying-stove and muffle. The drying-stove consists of an iron-legged table, resting on a brick platform, in which is constructed a furnace and horizontal flues. Upon the table is placed a layer of beech or boxwood sawdust, two iron stretching bars, and a few sieves. The heat of the iron-plate is just sufficient to keep the sawdust dry and warm without igniting it. Into one of the sieves with a small quantity of sawdust the gold is now turned, and then a hand-rubbing and shaking of the whole on the stretching bars follow. The friction thus engendered serves to brighten the planchets still further, and presently they are deposited in a muffle, or perforated copper cylinder. This is placed in a hot-air bath adjoining, and by gently agitating the contents the attendant is enabled to complete the "drying out," and remove every semblance of dust or foreign material of any kind.

A careful weighing up takes place, and upon a ticket which accompanied the bag of planchets from the weighing-room their weight is again recorded. A division of the contents of the bag into four portions is also made, and those portions are put into smaller bags, holding each 180 ozs. (15 lbs. troy), or 701 pieces. The small bags of gold are denominated "journeys," a word current only in the Mint and Bank of England, and being, with other peculiar terms in use at the former place, a legacy from the Normans. No doubt the word "journey" once had reference to a day's work of gold or silver coin produced in the Mint, though the latter, as being a less valuable material, was weighed up in larger quantities—namely, bags of 720 ozs. (60 lbs. troy).

The "journeys" of gold blanks are curiously folded in their clean little bags of canvass, packed snugly in companies of eight, into trays of wood,



very much resembling those used by butchers, and passed on to the coining-press room, there to receive that impress which shall fit them for the duty of circulation. We shall show presently how this last important step is effected.

### FOREIGN MINING AND METALLURGY.

Much attention has been devoted in the industrial world to the results disclosed in a public adjudication of locomotives just made by the administration of the Bernese State railways. The most considerable workshops of France, Germany, Belgium, England, and Switzerland competed at the adjudication, which became a kind of industrial tournament, shared in by almost every nation. The result of the adjudication has surprised every one, and it may be well perhaps to enter into a few particulars. The adjudication comprised 12 locomotives required to traverse the Bernese State line, having speeds of 10 to 15 ft. per 1000 ft., and curves of 1300 ft. radius. It was provided that they should be able to draw, independently of their own weight and water and coal, a load of 40 tons, at a speed of 30 miles per hour, without the consumption of combustible exceeding 34 tons of coal of first quality; in case the speed of the train was reduced to 22 miles per hour, it was further stipulated that the weight to be drawn should be increased to 60 tons, and with the still lower speed of 15½ miles per hour, the engines were to draw 70 tons. Annexed are the tenders sent in (in the amounts, it should be observed, including also sub-attestations of machinery):—Valcan Works, Stettin, 30,541l.; Messrs. Hawthorn, Newcastle, 30,388l.; the St. Léonard Company, Liège, 30,271l.; Messrs. Maffei, Munich, 28,697l.; the Sigi Works, Vienna, 28,202l.; Messrs. Morel and Co., Tullins, 28,160l.; Messrs. Schneider and Co., Creusot, 28,099l.; Messrs. Hartmann, Chemnitz, 27,800l.; the Cockrell Company, Sarneg, 27,632l.; Messrs. Escher-Wyss, Zurich, 26,661l.; Messrs. C. Erard and Co., Brussels, 26,350l.; the Imperial Engine Factory, Vienna, 26,130l.; Messrs. Koechlin and Co., Mulhouse, 25,741l.; the Esslingen Manufactory, 25,600l.; and the Carlsruhe Manufactory, 21,677l. The Carlsruhe Manufactory proposed in its tender to double the period of guarantee, and assured also a saving of 10 per cent. in the combustible employed. This tender was accepted, but the price to be paid for the engines was increased to 23,890l., on condition that the period of guarantee should extend over triple the time prescribed in the specification, and that the economy in combustible should be 30 per cent. On these terms a bargain was finally concluded. There is no salient fact to notice in connection with Belgian metallurgical industry, the situation remaining almost the same. Pig remains quiet, and without alteration at 37.2s. to 37.4s. per ton. Merchants' iron has less firmness, in consequence of the important stocks possessed by several works, which in order to run off their production must consent to slight reductions of price. Important contracts for coal have just been concluded at Charleroi, on account of the Belgian State railways. The price of pig remains nominally at 51. per ton at St. Dizier. English pig from Middlesbrough—Clarence, Cleveland, &c., marks—is offered at 41. 4s. to 41. 6s. per ton at the St. Dizier station. Iron is in moderate demand at St. Dizier, but prices have not much firmness. Rolled iron is quoted at 91. to 91. 4s. per ton, with a margin of 4s. between classes; mixed at 81. 10s. to 81. 12s. per ton. Bessemer iron has been better sustained at 107. 8s. to 107. 12s. for merchants' bars, and axes at 117. 4s. A letter from Bessemer observes, with reference to the fair held by French ironmasters in that town:—"Business is transacted with some diffidence, and in consequence has remained unimportant in extent; nevertheless, the price of pig is maintained. The principal reason for this is that a disposable stock is wanting in the blast-furnaces, and that certain forges are desirous of supplying themselves in anticipation of the important works which the great railway companies are about to execute. In presence of the movement of transformation, which every day becomes more decided, the capital question of the acquisition of wood will be the future of certain works, which find it impossible to modify their system of fabrication."

Little animation has appeared in the majority of the metal markets of the Continent, and with the exception of tin no article has specially attracted attention. Copper remains in the same state; prices are sustained, but there is little business doing, and consumers only buy to meet their strict wants. At Havre, Chilean and Peruvian bars have made 84½. Peruvian mineral (pure standard), 88½. United States, Baltimore, 90½. to 98½. Lake Superior, 96½. to 100½. Mexican and Plata, in bars, 82½. to 83½. Russian, 104½. to 106½. old yellow copper, 90½. to 96½. red ditto, 84½. to 84½. 8s. per ton. At Paris, English in plates has made 90½. tough cake, 90½. Lake Superior, 103½. Chilean, 87½. Corocoro mineral, 90½. red rolled, 100½. and yellow ditto, 90½. per ton. Zinc is more or less neglected, and notwithstanding the reduced prices at which it is quoted, very few buyers present themselves; at Havre, however, the low rates have attracted the attention of speculators, and towards the end of last week about 1000 to 1200 tons were run off. At Paris, rough Silesian has been quoted 181. 10s. to 191. and rolled 221. to 221. 10s. per ton; at Havre, the quotation has been 181. 2s. per ton; the rolled zinc of the Vieille Montagne Company has made 241. per ton. At Paris and Rouen, lead has experienced a slight revival, but the activity noticed in the demand has not been fully sustained. At Paris, Spanish samsuns have made 221. 8s., and French and Belgian 221. rolled, 251. 4s. per ton. At Havre, Spanish has brought 201. 2s. to 201. 3s. per ton. Attention for the moment is concentrated on tin, and the result of the public sales, which will take place on the 24th instant at Rotterdam, is awaited with impatience. At Amsterdam, the Banca has made 80 9/16. At Paris it is quoted at 140, while Detroit has made 136½, and English 135½. per ton. At Havre, Banca has ranged from 130½. to 132½. Detroit, 128½. Peruvian, 100½. to 114½. and Peruvian mineral, 84½. per ton.

The Grand Combe Mining Company, one of the few of the mining enterprises of France which makes its affairs public, following in that respect the example of the great railway systems, has just held its annual meeting, to which the administration reported progress for the exercise of 1862. In 1861 a considerable advance was effected in the production, as compared with 1860, but at the meeting of proprietors, held a year since, the administration expressed apprehensions that the intensity of the state might cause the company to experience a check in the course of progress which it desired to follow. This check was the distinctive feature of the exercise of 1862, and notwithstanding incessant efforts, it was found impossible to maintain the staff of workmen on the same footing as in 1861. The result was that the production remained slightly below that of 1861, and that in consequence of the scarcity of miners the working expenses were proportionately increased. The exercise of 1862 presented, then, a certain inferiority, as compared with its predecessor, but not sufficiently so to affect injuriously the dividend of the year, which remained at the same point as that attained in 1861. In 1862 the total production was 459,000 tons, as compared with 477,000 tons in 1861, 418,000 tons in 1860, 397,000 tons in 1859, and 347,000 tons in 1858. The council of administration regretted that the progress constantly achieved for four years should have been interrupted in 1862, but it reminded the proprietors that this progress could not be expected to proceed with mathematical regularity. Nevertheless, the administration expressed hopes that the normal rate of progress would soon be re-established; constant attention was being devoted to the best means of increasing the number of the company's workpeople, and recently upwards of 100 labourers, without work in the cotton districts of Normandy, had been brought to the mines. The current exercise seems likely to furnish a production superior to that of 1862; but, at the period of the year at present reached, it is not possible to predict or guarantee the work's confidence. The sale of the company's products necessarily reflected last year's reduction in the production; nevertheless, it was less in amount, and was, in fact, only 9000 tons below the point reached in 1861. The series of totals represented by the company's sales during the five years were as follows:—1862, 469,000 tons; 1861, 478,000 tons; 1860, 426,000 tons; 1859, 381,000 tons; 1858, 359,000 tons. The sales of coke last year were 56,000 tons, about 5000 tons less than in 1861. As regards agglomerates, the sales amounted, in the year 1862, to 69,000 tons, and the council of administration considers not only that this was an important quantity, but that the fabrication is an indispensable one for a great mining company, those collieries concerned which do not engage in this purpose being really crippled. The profits of the exercise of 1862 amounted to 73,992l., from which the council of administration had to deduct first of all a sum of 8776l. for replacements in connection with various works of detail. The net profit was thus reduced to 65,216l., but from this amount 5187l. had again to be deducted for interest on loans, taxes, &c., leaving a clear profit of 60,029l. From this, again, a statutory deduction of 5 per cent. had to be made on account of the reserve, leaving a definitive disposable balance of 56,063l. Works of detail executed during the year exercised involved a total expense of 8776l., of which 2525l. referred specially to the mines, and 3541l. to the establishment of service railways, and especially the replacement of capital effected in this way during the exercises of 1859, 1860, 1861, and 1862 amounted to 31,405l. At the last general meeting the administration explained fully and completely the financial position of the company from the commencement to Dec. 31, 1861, and a statement was also given as to the manner in which it was proposed, without making any deductions from the profits, to provide for various new works undertaken in addition to those already advertised. To effect this it may be necessary to have recourse this year to the placement of a number of obligations, the creation of which has been for some time authorised. The rough profits of last year amounted, as previously indicated, to 73,992l.; but the deductions made from the floating capital for the replacement of capital effected in this way during the exercises of 1859, 1860, 1861, and 1862 amounted to 31,405l. for which it may be necessary to provide, in whole or in part, in the manner just intimated. The net definitive profits of 1862 amounted to 66,063l., a total slightly below the 67,000l. required to provide for a dividend of 21. 8s. per share (the present price is a fraction below 38½); but as last year the net disposable profit exceeded by more than 4000l. this sum of 57,000l., and the administration declined, notwithstanding, to advance the dividend from the point at which it had stood for several years, so it now felt justified in not reducing it. The council accordingly proposed and carried a dividend of 21. 8s. per share, the same rate of distribution adopted in 1861, 1860, and 1859. Taking a general view of the situation, the administration comes to the conclusion that the general situation of its market has improved, the perturbations which had previously affected it having ceased to exert any influence upon it; that the consumption of the company's coals in the Mediterranean has assumed a considerable extension, and acquired a definitive character; and that the qualities of the secondary products obtained—coke and agglomerates—completely satisfy all consumers. On the whole, the administration completely considers that it is advancing with perseverance in the improvements of various kinds which it has long steadily pursued. Thus not only have a church and convent buildings destined for educational and religious purposes been completed for the benefit of the workpeople employed by the company, but the means of ventilating and draining the mines have also been improved, and in all respects but one—the insufficiency in the working staff—the exercise of 1862 was a step in advance in the general career of progress which the undertaking presents. The growing development of some neighbouring workings is certainly one of the causes which have contributed to this state of things, and, on the other hand, the scarcity of labour and the urgent want of operatives at certain periods of the year, in connection with the attention required to be given to vines, and other special cultures, have raised the wages of simple labourers in the South of France to such a point that the recruitment of the company's workshops has become a serious difficulty. As regards administrative combinations and moral and material arrangements for attracting and retaining the working class, nothing is wanting at the Grand Combe. All that can be done has been done, and the administration is convinced that it cannot stimulate the recruitment of workpeople by biddings in regard to wages as powerless as they are liable to abuse. In great collections of workpeople it is important that the rate of wages should be remunerative, and that it should be wisely and equitably maintained and graduated; but it is also necessary that it should have a certain degree of fixity, without which variations become a game for the workman, an incessant provocation to struggle, displacements, and want of discipline. The administration has not hesitated to consent to ad-

vances of wages when they have been admissible, but it seeks also to maintain the prices of bread, meat, and provisions at as nearly as possible the same rate, and to adjust wages with a certain regularity, or, at least, to render the variations less rough and marked. Notwithstanding all its care, there is still a want of labour; but the council considers that each year adds, nevertheless, new elements of stability to the undertaking.

### THE TIN TRADE.

Concerning the approaching sale by the Dutch Trading Company, various opinions are entertained as to the price which, considering the present position and prospects of the trade, purchasers will be justified in paying. A well-informed correspondent, whose communication we published in last week's Journal, considers that from 73 fls. to 75 fls. is quite as much as the present state would warrant, and although this would be a decline of fully 5 fls. compared with the prices ruling at the time he wrote, there seems reason to believe that if a higher price be paid a reaction may shortly set in, which will have a generally prejudicial effect.

Mr. N. Breebaart (Goll and Co., Amsterdam), under date June 15, writes:—"The campaign which is now drawing to its close did not offer any very favourable prospect at its commencement. The price of 67½ fls., established at the public sale, was not considered high, and still it became very soon apparent that even this moderate price could not be supported, and that it was useless to deceive oneself with regard to the future course, in the presence of the apathy with which the result of the sale had been generally received abroad, and of the languid state of all branches of industry in general. A little later, however, unforeseen circumstances produced a favourable change, and speculative purchases gave rise to a gradual improvement in prices. It was in the first instance the demand of Straits tin for China and Japan; next, the news of the loss of a lighter vessel with 16,000 slabs of tin on board; at last, the (quasi official) rumours of a very considerable reduction in the production of the Banca mines. At the commencement of the present month 80 fls. was paid, but this price was only submitted to in one single instance, and during the last days purchases might have been made on lower terms. But as after all the holders of the 30,000 slab old stock have hitherto felt very little inclined to sell below 70 fls., it is natural to conclude that the opinion is pretty generally established that the next sale will not bring us a lower figure. This supposition is, perhaps, not without foundation; but it is of less importance at present to examine this question than to know whether the position of the metal justifies such a price for the approaching sale, without even mentioning a higher price, which would by no means be surprising if fresh speculative purchases were added to those which will be made for ordinary consumption. The stock which must supply the wants of the next campaign falls 10,000 slabs short of the average consumption of the last few years. This fact is certainly not without some importance, but, next to the available quantity, we must place the actual wants, and ask the question, whether there is reason to expect an increase of consumption in the present state of politics, trade, and industry? We are not of this opinion, and, besides, may we not with perfect justice consider as pure re-warehousing a large proportion of the shipments made to England during all the period that speculation has had such a large share in the business? But even estimating the deliveries or, better still, the wants for consumption, at 140,000 slabs, there will always remain a balance of 10,000 slabs at the end of the next campaign. This surplus would certainly be of little use, if in 1864 we had to expect a repetition of such a small sale as we have at present before us. But since an official and very positive declaration has proved that the apprehensions in relation to a reduced production of the Banca mines are without foundation, and that, on the contrary, according to these official declarations, the production of those mines in 1862 exceeds the average production of last year, there is reason to presume the sale of 1864 will contain a large quantity, and re-establish the equilibrium. It is true that, however large the quantity may be that will be offered at that period, consumption will be limited to the quantity left at our disposal of the campaign of 1863; but if the probability of a small sale has acted in favour of the article many months beforehand, it is but reasonable to admit that the certainty of a large sale cannot remain long without its influence, unless some incident occurs to neutralise its effect. It is not known why the supplies of the Trading Society are behindhand this year. But what confirms us in our expectations for next year's sale is that Batavia letters mention an available stock in the Island of Banca of 120,000 slabs, for which the Government is trying to engage a room to bring this quantity to the different ports of Java, prior to its ulterior shipment to Holland. We cannot account either for the enormous shipments which in such an unforeseen way have been made from the Straits to China and Japan. According to the last accounts from these quarters, the demand had not yet subsided, although it was less pressing. This fact is, no doubt, of great importance, but still must we conclude therefrom that this demand will remain permanent? This is a problem which can only be solved hereafter. As to the 16,000 slabs foundered in the Indian Archipelago, not far from the coast, it appears to us that not too much weight must be attached to this point, as it is but fair to presume that measures will have been taken to save at least the greater part. In conclusion, we add the statistics of the combined Dutch and English stocks on May 31, viz.:—

|  | 1863.     | 1862. | 1861. | 1860. |
|--|-----------|-------|-------|-------|
| Including the quantity declared for public sale..... | Tons 4430 | 5348  | 5450  | 5445  |
| In London.....                                       | 2385      | 1892  | 754   | 1030  |
| Together.....  | 6815      | 6940  | 6204  | 6525  |

During all the period that Straits tin has found a sale out of Europe the importations in London have been very small. We do not discover, however, the effect of this in the preceding figures, as at the end of May the stocks amounted still to double the average of last year's. The quantity of Straits tin at present certainly much below the same period last year; but as the combined stocks still exceed the average amount of the last year's, it appears to us that there is really not much cause to entertain serious uneasiness in this respect.

Messrs. Koch and Vlierboom, under date June 12, write:—"Numerous fluctuations have taken place since the sale of June 25, 1862, which went at 67½ fl., the lowest price being in August, when sales were made at 66½ fl., and the highest, 80 fl. In the present month, the quotation being now about 79 fl. The total deliveries in Holland during the whole season are calculated as follows:—

|                           |       |         |                 |       |         |
|---------------------------|-------|---------|-----------------|-------|---------|
| Total deliveries, 1862-63 |       |         |                 |       | 140,401 |
| Against 1861-62           | Slabs | 157,004 | Against 1855-56 | Slabs | 142,976 |
| 1860-61                   |       | 150,437 | 1854-55         |       | 129,510 |
| 1859-60                   |       | 127,963 | 1853-54         |       | 136,600 |
| 1858-59                   |       | 203,291 | 1852-53         |       | 138,060 |
| 1857-58                   |       | 170,790 | 1851-52         |       | 147,046 |
| 1856-57                   |       | 172,864 | 1850-51         |       | 147,000 |

The quantity available up to the next sale, in 1864, will amount, therefore:—

|              |               |              |               |
|--------------|---------------|--------------|---------------|
| Total        | 157,992       |              |               |
| Against 1862 | Slabs 175,093 | Against 1858 | Slabs 223,938 |
| 1861         | 185,716       | 1857         | 214,251       |
| 1860         | 178,153       | 1856         | 216,241       |
| 1859         | 154,603       |              |               |

The article has constantly maintained an upward tendency since the sale of 1863; from 67 fl. we advanced gradually to 79 fl., and the transactions which have taken place have been distinguished during the whole period for regularity, which denotes that they have only followed the natural impulse of demand arising from actual wants, and it was only at a later period that speculation became mixed up with it. The principal reason for this advance must be attributed to the sudden, unexpected, and strong demand for Japan, and, partly also for China, against which in Japan they are issuing a new coinage, composed chiefly of tin, large quantities have been required in the Straits, where, in consequence, shipments to Europe have been suspended, to be directed to the extreme east of the north; the price realised left such large profits that shipments have even been made from England and Holland. This demand has created a powerful diversion in favour of the article, as the demand had been previously estimated to have exceeded the consumption. These circumstances have not yet entirely ceased. The demand for China and Japan continues, the prices in the Straits would leave a loss in Europe, and the supplies from those quarters, are consequently, limited. Adding to this the forthcoming sale leaves a deficit of 30,000 to 35,000 slabs, as compared with preceding years, and hence opinions as to the article, and expectations are entertained that the result will be satisfactory. Of Billiton tin not a single slab will be offered for sale, which increases still further the deficit. The Billiton Company have determined to sell their tin regularly at Batavia, in April, August, and December, when it will most likely be bought for the United States, China, and Japan. Since 80 fl. has been paid the demand has a little subsided, and there are sellers to-day at 79 fl. There are in the market 670 slabs of Malacca tin atfoat from Macassar, per *Wilhelmina*, with a round stamp; the holders affirm that the quality is prime, and equal to Banca.

**AN AMERICAN MONSTER FURNACE.**—We mentioned some time since that, in anticipation of a demand for guns of even larger calibre than 15 in., a furnace of extraordinary capacity was being erected at the Fort Pitt Foundry, Messrs. Knap, Rudd, and Co. The furnace has since been completed, and several charges of iron melted in it, but until Thursday none approximating its full capacity. Our readers will remember, from the accounts we have given from time to time, that three furnaces were employed in melting iron for the first 15-inch gun cast at the works, and each of these crowded beyond its proper capacity. Subsequently, two furnaces were erected in the new foundry, each of nearly 25 tons capacity, and from these all the 15-inch guns since made have been cast. The first experiment was made of melting a sufficient charge in a single furnace, that recently erected, to cast one of these huge pieces of ordnance: 38 tons of metal (76,000 lbs.) were piled in the furnace, and fire applied between 8 and 9 o'clock A.M. Between 3 and 4 P.M. the immense mass was completely reduced. The furnace was tapped, and a stream of iron, cleaner than we have ever seen run under the same circumstances, poured into the mould at an intense heat. The experiment was pronounced an entire success, and hereafter, we have no doubt, the new furnace will be chiefly employed in casting the 15-inch guns. This monster furnace is 8 feet in width and 81 feet in length, divided into three interior compartments—this "bar," 7 feet; "post," 6 feet; and "kiln," 18 feet. The stack rests upon a foundation of 13 feet square and 12 feet in height, above the surface level. It is 8 feet interior and 12 feet exterior diameter, and nearly 60 feet in height. It was built, as were all the other furnaces, under the supervision of Mr. Joseph Kays, the foreman of the foundry, and is a credit to his enterprising spirit. Although limited on Thursday to a charge of 38 tons, it has a capacity for melting fully 10 tons more, and will, doubtless, ere long, be tested to that extent. So far as our sources of information extend, the furnace is the largest in the world, and we have reason to believe that no charge even approximating 38 tons has ever before been melted in one furnace at a single heat. But three or four years ago furnaces of 8 and 10 tons capacity were looked upon as sufficiently large to meet the requirements of any business, and the rapid increase of capacity is, in no inconsiderable degree, to the course of the ordnance bureau in ordering large guns. The Fort Pitt Foundry is now supplied with six furnaces, of an aggregate capacity of about 191 tons. Of course such an enormous quantity of iron, of such quality as that required for cast-iron ordnance, cannot be obtained; otherwise the capacity of the foundry, in the manufacture of ordnance, would have no limit below the figures stated. This statement, of course, does not include the manufacture of shot and shell, the metal for this being melted in large cupolas.—*Pittsburg Dispatch.*

Capt. Davis Hatch, of Norfolk, Connecticut, who has returned from a visit to the salt mines at the east end of St. Domingo, states that there is a mountain there of pure rock salt 10 miles long, 1½ mile wide, and 400 ft. high. He has obtained from the Government of St. Domingo a grant for working the mines, and the exclusive privilege for making a railroad from the mines to the port of Barahona, 12 miles distant.

### Meetings of Public Companies.

#### NATIONAL PROVINCIAL BANK OF ENGLAND.

An extraordinary general meeting of proprietors was held at the head office, Bishopsgate-street, on Monday, for the purpose of confirming or otherwise the following resolution passed at the annual general meeting, held on May 24:—"That it appearing that of the 30,000 (207) shares created in 1862, 426 shares, originally allotted to trustees and others, had reverted to the bank, the directors be requested to re-allot such 426 shares among the members of the board, subject only to the payment of the calls thereon; and confirming such resolution or otherwise as such extraordinary general meeting may determine."

Mr. JOHN MINET LAURIE in the chair. Mr. A. ROBERTSON read the advertisement convening the meeting. The CHAIRMAN said he trusted the proprietors would not think that in calling them together for the purpose of considering the resolution they were putting them to any unnecessary inconvenience. He believed that the shareholders had full power at any annual general meeting to confer on the directors any extraordinary remuneration which they deemed expedient, and most certainly the resolution passed on May 14 was adopted most generally by a very full meeting. He hoped they would agree with the directors that they ought not to accept the very handsome gift conferred on them without giving an opportunity to any shareholder who was not present at the former meeting to express his opinion favourable or unfavourable to the resolution. The directors trusted, moreover, that the shareholders would not think that they were in any way appearing to undervalue a munificence as liberal in its amount as it was rendered acceptable by the cordial manner in which it had been conferred, if they declined to receive the annual shares offered them, not subject to the payment of the premium of 41. per share. He felt that the company ought not to be losers by their liberality, and that the directors could only accept the shares on the same terms that they were offered to the other proprietors. He left the matter entirely in the hands of the shareholders.

Mr. C. REILLY, the mover of the original proposition, regretted to find that the offer which the proprietors had made to the directors, and to which they were most certainly due, had been declined; but as that was the decision of the board, all he could do was to re-frame the proposition in accordance with their wishes. He could only repeat that he very much regretted it, as he was sure that his brother proprietors. He then moved an amended resolution, to the effect that the 426 shares be tendered to the directors upon the same terms as those on which the original allotments were made—namely, at a premium of 41. per share.

Mr. HARRISON said, as he had the honour of seconding the original proposition, he would now take the opportunity of seconding the proposition, as amended. It was unnecessary to say a word in favour of the general conduct of the bank, as it spoke for itself by the high state of prosperity and efficiency with which it had been characterised for a series of years. As regards the late measure, the offer now made to the directors arose exclusively out of a new state of things in connection with the bank. Last year the capital of the bank was augmented by the issue of new shares, and no measure, he contended, that had ever been adopted was so wise or so beneficial to the institution; it was a measure sound in its principle, and exclusive in the mode in which it was carried out. It was sound in its principle, because it enlarged the basis of the bank's operations, which were now so extended and established, that there was hardly a bank in the whole country that could be compared with it. And the willingness of the directors to accept the new shares at 41. premium was, at any rate, to his mind a satisfactory evidence that they relied upon the capabilities of the bank, and that it would be able to maintain its dividends upon the increased capital. If they looked at the exclusive way in which it was carried out, it must evoke the admiration of the proprietors; for while they became possessed of shares at the very low premium of 41., the amount thus realised was to be appropriated to an object which cannot but tend to prove of permanent benefit to all interested in the institution. As it was not the intention of the directors to accept these shares upon any other terms than those upon which they had been offered to the proprietors, the bank would not be giving up any money, but it would be merely taking advantage of an accidental circumstance of trustees and others having declined to accept these new shares. He trusted there would be, if not a unanimous vote, such a large majority in favour of the proposition that would at once put the directors in possession of these shares.

Mr. E. KING said, if the directors were not paid for their services it would be a different matter, but seeing that the twelve members of the board received 8000l. for their remuneration, he was much surprised to find that the shareholders had agreed to give them nearly 8000l. He gave the board the greatest credit for the efficient way in which they conducted the company's affairs, but, at the same time, he felt bound to protest against the proposition.

Mr. REILLY said the last speaker had inferred that the proprietors were about to give the directors 8000l. Now, that was certainly not his view, nor did he believe it was the view of the proprietors generally. The fact was, the bank had been brought to a most successful issue, and had given enormous dividends, larger than could be realised from any other investment; and, therefore, the directors deserved the highest confidence of the proprietors; and as to the remuneration received by the board, he considered that was altogether inadequate for the great and efficient services they rendered.

Capt. GRANT had been a large shareholder from the commencement of the bank, and some time since having, as a local director, taken an active part in its affairs, he could bear testimony to the zeal, judgment, and business-like manner in which the whole of its business had been conducted. He considered the present was a favourable opportunity for proprietors to mark the high appreciation of the directors of which they had all received practical and substantial proofs. As far as he was concerned, he held it to be a privilege to have an opportunity to offer the directors a recognition of their able and successful services.

A PROPRIETOR said it appeared to him that so far as the bank itself was concerned it had nothing whatever to do with these shares; the only question was whether they should be shifted from certain parties who declined to accept them to other proprietors who were willing to take them upon the same terms as those upon which they were originally allotted.

Mr. REILLY confessed that at the first blush of the question he was somewhat surprised at the proposition, but upon mature deliberation he was bound to say he cordially supported it. He was, however, by no means sorry that this debate had occurred, on the contrary, he thought it was a very fortunate circumstance, because the proprietors now possessed more intelligence upon the subject than hitherto. It was not as though they were voting anything out of the funds of the bank, but they were merely taking advantage of an exceptional circumstance to enable them to perform a grateful act. He agreed with the first original proposition, and he would cordially support it as amended.

The resolution was then put, when the numbers were 23 in favour, and 7 against it. The CHAIRMAN said that during the discussion the lips of the directors had been entirely sealed, but now that it had been decided by so large a majority, it would be unfair to themselves if he did not refer to the grounds upon which they felt they merited this munificent gift. His friend on his right had just informed him that the value of the original shares had increased to 400 per cent. He thought that was some reason on the part of proprietors for showing satisfaction with their directors, or at least with the result of their management. Every original proprietor must recollect the many difficulties against which the bank had originally to contend, all of which, happily, had been surmounted, and the bank was now pursuing an unexampled career of prosperity. The remark that had fallen from the last speaker, that the directors' remuneration was not too high, was perfectly true; for since he had been honoured with a seat at the board—a period of nearly 20 years—there often had been great difficulty in filling up the numbers, suitable members, amounting at one time to 18. But the number was now reduced to 12—so much for the remuneration of the directors being excessive. It was not to be supposed that commercial men of high standing would daily attend for the sake of one or two guineas, for what they wanted was not showy names, but gentlemen who would daily give their time and attention to the affairs of the bank. (Hear, hear.) Men who would look most minutely into every detail, and who would fully consider every particular connected with the management of the bank, and who would be perfectly certain that this mark of liberality on the part of proprietors would not be forgotten by the directors, for the remuneration they received was not with them a matter of any very considerable moment, and, therefore, he thought he had a right to say that he was perfectly certain the shareholders were consulting their own interests in acknowledging the services of the directors in having brought this institution to its present unexampled degree of prosperity. It could not fail to act as a great incentive to the directors to continue their exertions in the promotion of the best interests of the proprietors; and he trusted that at each successive meeting the same cordiality and good feeling would exist between the directors and their constituents, and that the bank might never again have an opportunity of giving such a substantial mark of their approbation.

The usual complimentary votes having been passed, the proceedings terminated.

#### KAPUNDA MINING COMPANY.

The annual general meeting of shareholders was held at the London Tavern, Bishopsgate, on Monday.—Mr. C. S. BAGOT in the chair.

Mr. J. D. KENNEDY (the secretary) read the notice convening the meeting, and the report of the directors, with accounts annexed, an abstract of which was published in last week's Journal, and, having been previously circulated amongst the shareholders, was taken as read.

The CHAIRMAN said that, beyond what was contained in the report, he had not many observations to make; but he thought it right to say a few words in expressing his regret that the report was not more satisfactory. It was at all times impossible to command success, more especially in connection with mining operations, and the past year they certainly did not succeed in the way they would have desired. There were two cases which had contributed principally to their unsatisfactory position. In the first place, they had not raised so much ore, and what they had raised was not so good in quality; and, secondly, the price of copper had been very low. It had been stated in the report that they had received only 89½. Instead of 89½. per ton, which was the price of last year. This showed a diminution of 11. 7s. per ton; but they must consider, also, that even the 89½. was a very much lower price than they had received in previous years. Had they succeeded in obtaining the average price of former years, they would still have been able to have shown a profit of 5000l. to 6000l., even on the reduced amount produced. With reference to the operations in the colony, he might state that the attention of the manager had been directed to the improvement of the machinery, and, with respect to the operations underground, they had been laying open fresh tribute ground at the 60 ft. level, which had not at present turned out as well as anticipated. The manager was now sinking to the 70 ft. level, and it was hoped, if the lodes were regular at that point, the property of the mine would be much increased. The manager had expressed his conviction that there was plenty of ore in the mine, although the ground was not quite so regular as could be wished. They were not at present altogether dependent upon the results of the lower levels, as they had shallow lodes going downwards; indeed, the great bulk of their ore came from the shallow levels. The shareholders might rest assured that the manager would effect every economy consistent with securing efficiency; but they must recollect that in a new country like Australia the difficulty of effecting a reduction was much greater than in this country, and even here the difficulty of making 10 per cent. reduction was well known to all. Under these circumstances, he did not think they could reasonably expect any considerable reduction beyond that which had already been made. Their copper enjoyed a fair reputation in the market, and he saw no reason to fear that they would be able to maintain it. He concluded by moving that the report and accounts be received and adopted.

A SHAREHOLDER enquired what opinion was expressed by the manager with regard to the prospects of the mine?

The CHAIRMAN did not find that in his last report (they were all aware that by the last mail all the South Australian letters were missed) he made any special reference to the prospects. In his previous report he wrote that "the prospects of the mine were improving; the tributers were in better spirits, which is generally a very good indicator."

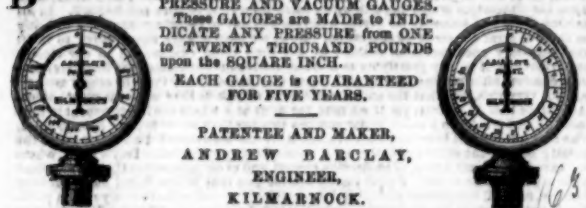
Mr. PEACOCK remarked that the price which they were at present getting for their copper was 89½. per ton, and he understood that their usual cost of producing it was about 70½., so that, considering 500 tons (the amount produced in the present year) were raised







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Fully described in the MINING JOURNAL of July 5.

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Who respectfully begs to bring the above to the notice of the mining public, as an exceedingly cheap and easy method of applying water-power for the above purposes. The TURBINE, WINDING, AND PUMPING MACHINERY are all fixed complete to one strong cast-iron bed plate, which can be placed in any situation without pit or excavation, and any height not exceeding 33 ft. from bottom of fall, the supply and section pipe being all that is required to be connected to it, and can be brought in any direction. This combined machine can be easily removed when necessary.

G. Low begs also to state that the TURBINE is the most efficient and the cheapest method of applying water-power for mining purposes.

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G. Low begs to recommend a special class of turbine adapted for extreme high falls (200 to 500 ft.), and consuming small quantity of water. This turbine will work with equal advantage without running at an excessive velocity. Also, MANUFACTURER OF IMPROVED BORING MACHINES FOR DRIVING ADITS.

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APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. BASTIER begs to call the attention of proprietors of mines, engineers, architects, armers, and the public in general, to his new pump, the cheapest and most efficient ever introduced in public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine, as daily demonstrated by use:—

- 1.—It utilizes from 90 to 92 per cent. of the motive power.
- 2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.
- 3.—It occupies a very small space.
- 4.—It raises water from any depth with the same facility and economy.
- 5.—It raises with the water, and without the slightest injury to the apparatus, sand, mud, wood, stone, and every object of a smaller diameter than its tube.
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A mining pump can be seen daily at work, at Wheel Concord Mine, South Sydenham, Devon, near Tavistock; and a shipping pump at Woodside Graving Dock Company (Limited), Birkenhead, near Liverpool.

J. U. BASTIER, sole manufacturer, will CONTRACT TO ERECT HIS PATENT PUMP AT HIS OWN EXPENSE, and will GUARANTEE IT FOR ONE YEAR, or will GRANT LICENSES to manufacturers, mining proprietors, and others, for the USE of his INVENTION.

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London, March 21, 1859. Hours from Ten till Four. J. U. BASTIER, C.E.

# STATISTICS OF AND OBSERVATIONS UPON THE MINES OF CORNWALL AND DEVON.

Illustrated by Maps, Plans, and Sections of the Principal Mining Districts in the two counties.

By Mr. THOMAS SPARGO, Mining Engineer, Stock and Sharebroker, Gresham-house, Old Broad-street, London.

It contains detailed particulars of the indications and prospects of all the important mines in the two counties, with annual statistical returns, and dividends paid by each; sections and diagrams of the most productive districts, with explanatory notes upon each; as also a map of Cornwall, showing its area and population.

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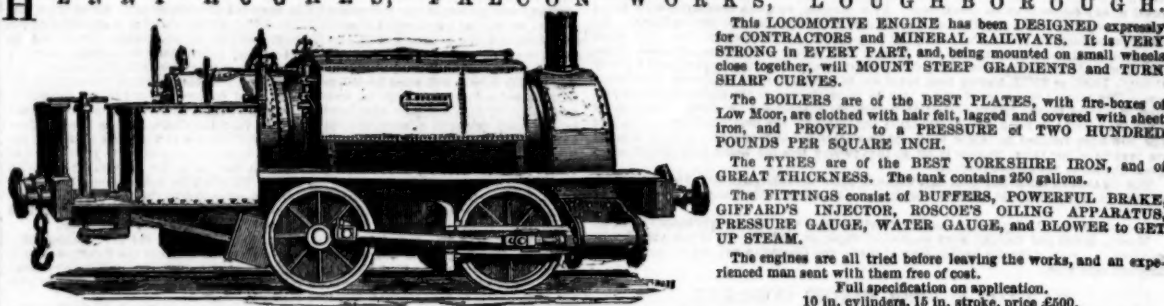
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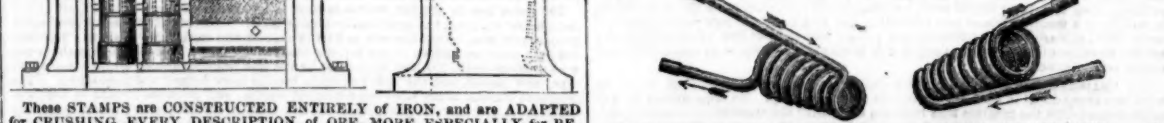
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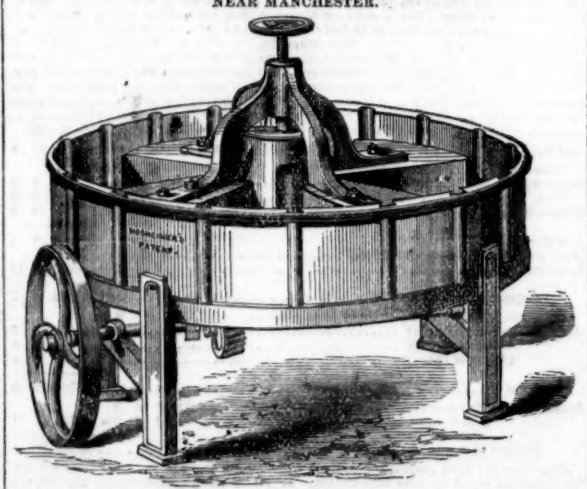
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